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Non-Credit Algebra as Preparation for Later Mathematics Courses

By JOHN R. KINZER AND LYDIA GREENE KINZER

AMONG 1,244 students who enrolled for Mathematics 421 at Ohio State University in the fall quarter, 1946, there were 89 students who either had not taken a course in high-school algebra or had failed to pass the placement examination in that subject. Before taking the first course in college algebra (Mathematics 421) these students had been required to take Mathematics 401.

The descriptions of these two courses given in the University Catalogue for 1946 are as follows:

Mathematics 401. Elementary Algebra. No credit hours. One quarter.

This course is designed for students entering the University without having had high-school algebra, and for those students who failed the proficiency examination which is prerequisite to Mathematics 421. The following topics are covered: signed and literal numbers, fractions, factoring, graphs, simultaneous equations, quadratic equations.

Mathematics 421. College Algebra. Five credit hours. One quarter. Prerequisite, Mathematics 401, 404, or the equivalent.

Exponents and radicals, graphs, theory of quadratic equations, determinants of third and fourth orders, ratio, proportion, variation, logarithms, arithmetic progressions, geometric progressions, compound interest and annuities, permutations, combinations, binomial theorem, probability, partial fractions.

Of the 89 students, 52 had completed Mathematics 401 in the quarter just preceding enrollment in Mathematics 421. The students were from the following colleges:

	Number of Students	Per Cent of Group
Engineering	46	51.7
Arts and Sciences	29	32.6
Agriculture	10	11.2
Education	4	4.5

TABLE I

DISTRIBUTION OF MATHEMATICS MARKS FOR 89 STUDENTS WHO TOOK MATHEMATICS 401 BEFORE TAKING MATHEMATICS 421 DURING AUTUMN QUARTER, 1946

Marks in Subsequent Mathematics Courses	Per Cent Receiving the Indicated Marks in Mathematics 401					Per Cent of Original Group
	A	*B*	*C*	*D*	*E*	
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Math. 421—						
A	2.2	1.1	0.0	0.0	0.0	3.4
B	5.6	1.1	1.1	0.0	0.0	7.9
C	10.1	14.6	10.1	1.1	2.2	38.2
D	4.5	5.6	10.1	1.1	1.1	22.5
E	2.2	7.9	12.4	3.4	2.2	28.1
Math. 422—						
A	3.4	1.1	0.0	0.0	0.0	4.5
B	5.6	1.1	0.0	0.0	1.1	7.9
C	11.2	10.1	7.9	1.1	1.1	31.5
D	1.1	4.5	4.5	2.2	1.1	13.5
E	1.1	3.4	7.9	0.0	0.0	11.2
Not taken	2.2	10.1	13.5	2.2	2.2	30.3
Math. 423—						
A	1.1	1.1	0.0	0.0	0.0	2.2
B	2.2	2.2	1.1	0.0	0.0	5.6
C	2.2	3.4	2.2	1.1	2.2	11.2
D	6.7	4.5	3.4	0.0	0.0	14.6
E	1.1	3.4	2.2	0.0	1.1	7.9
Not taken	11.2	15.7	24.7	4.5	2.2	58.4
Math. 441—						
A	0.0	0.0	0.0	0.0	0.0	0.0
B	1.1	2.2	0.0	0.0	0.0	3.4
C	5.6	3.4	2.2	1.1	2.2	14.6
D	1.1	0.0	1.1	0.0	0.0	2.2
E	1.1	2.2	2.2	0.0	1.1	6.7
Not taken	15.7	22.5	28.1	4.5	2.2	73.0
Math. 442—						
A	1.1	0.0	0.0	0.0	0.0	1.1
B	0.0	2.2	0.0	0.0	0.0	2.2
C	3.4	0.0	1.1	0.0	1.1	5.6
D	0.0	1.1	2.2	0.0	0.0	3.4
E	0.0	2.2	0.0	0.0	1.1	3.4
Not taken	20.2	24.7	30.3	5.6	3.4	84.3
Math. 443—						
A	0.0	1.1	0.0	0.0	0.0	1.1
B	2.2	1.1	0.0	0.0	0.0	3.4
C	2.2	1.1	1.1	0.0	0.0	4.5
D	0.0	0.0	0.0	0.0	0.0	0.0
E	0.0	1.1	1.1	0.0	1.1	3.4
Not taken	20.2	25.8	31.5	5.6	4.5	87.6

The mean score of these 89 students on the Ohio State Psychological Examination was at the 54.8 percentile. The whole group—1,244 students—in Mathematics 421 had a mean score at the 63.4 percentile.

Judged on the basis of scores on the Ohio State Psychological Examination, this group is not different from the usual freshman group of students, but they fall slightly below the O.S.P.E. scores of the group taking College Algebra. The chief deficiency of this group is apparently the lack of knowledge and skill presumed to be obtained in the high-school course.

In Table I it is possible to follow these 89 students through six quarters of college mathematics. These courses are: College Algebra (Mathematics 421), Trigonometry (Mathematics 422), Analytic Geometry (Mathematics 423), and a three-quarter sequence in Calculus (Mathematics 441, 442, 443).

Table I shows that the students who do poorly in Mathematics 401 seldom go beyond Mathematics 421. Those who

TABLE II

THE PERCENTAGE OF EACH GROUP OF STUDENTS FAILING IN SUBSEQUENT MATHEMATICS COURSES

MATHEMATICS COURSES BY NUMBER	STUDENTS WHO HAD MATHEMATICS 401		ALL STUDENTS TAKING MATHEMATICS 421	
	Number Taking Course	Per Cent to Fail	Number Taking Course	Per Cent to Fail
(1)	(2)	(3)	(4)	(5)
421	89	28.1	1,244	12.5
422	61	16.4	978	7.9
423	37	18.9	693	12.3
441	24	25.0	536	9.1
442	14	21.4	416	8.7
443	11	27.3	326	7.1

continue make relatively poor marks in the advanced courses. Fewer and fewer students continue through Calculus. Only 11 of the 89 went through the three quarters of Calculus and three of them failed the last quarter of Calculus. Eight students out of 89 successfully completed the entire six quarters in mathematics.

In Table II are shown the percentages of failures for the students who took Mathematics 401 and for the larger group of which they are a part. A comparison of the percentages for each subsequent course shows a large proportion of failures among the students who had to take Mathematics 401. Apparently the mathematical skill or information gained from this make-up course is not sufficient to guarantee a promising mathematical future.

Does Teaching Appeal to the Better Student?

By RALPH E. HEIGES

WHEN a person engaged in teacher education attends a conference involving public-school teachers, he often hears, "You people preparing teachers take everyone into college and graduate all of them." The implication appears to be that little selection is made. If that is true, something should be done and done quickly. Throughout the country there is evidence of improvement in courses for the preparing of teachers. Pennsylvania institutions have added faculty and facilities to keep pace. Although many things are needed to improve the teaching profession, nothing will improve its standing more than the high quality of the people who enter it. Fundamentally, the best high-school students must be convinced of the advantages and rewards of teaching. Then, the colleges must assume their responsibilities.

There appears to be evidence, widely disseminated, that the teaching profession does not appeal to a large proportion of the best high-school students. No attempt is being made to cover the country-wide situation in this paper. We are, however, considering the students graduated from one of the state teachers' colleges of Pennsylvania. There is no attempt to compare the quality of graduates within different professions or within colleges. Here the experience of one college is reported.

The group studied includes the 516 students who entered the Indiana State Teachers College in September, 1949. Some have already graduated through acceleration. It is presumed that all those in college in March, 1953, will be graduated in May or during the following summer. It is also assumed for purposes of this study that all those not now enrolled at Indiana will not eventually be graduated. All students now in college are tabulated in the curriculum from which they will be graduated.

In the interests of clarification it should be noted that the college operates under the admission standards established by the Board of Presidents of the State Teachers Colleges. The scholarship requirements may be summarized as either of two criteria, graduation in the upper half of the high-school class

or the passing of a scholastic aptitude test with a score equal to the median of a high-school Senior.

A college committee on admissions and professional standards supervises admission. It also directs the continuance of students in college. At the end of the sophomore year each student applies for junior standing and the committee makes a complete and formal check of each application. Areas of academic scholarship, English, health, speech, personality, and achievement tests in English, general culture, and contemporary affairs are considered. A fifth semester may be allowed for the purpose of clearing deficiencies, but there are definite standards that must be met. We at Indiana think the standards not only are fair but are also in the interests of the student.

THE response to the question, Does teaching appeal to the good student in high school? must be affirmative. The following table shows that 53 per cent of the 1949 Freshmen came from the upper quarter of their high-school classes:

Rank in High-School Class	Number in Quarter	Per Cent in Quarter	Per Cent Graduated
1st quarter	271	53	63
2nd quarter	134	26	63
3rd quarter	73	14	40
4th quarter	38	7	26
Total	516	..	57

One out of every three of these students stood first, second, third, fourth, or fifth in his high-school class. Twenty-six per cent were in the second quarter, leaving only 21 per cent in the lower half. Only 7 per cent came from the fourth quarter and these were screened through an entrance test.

Details are given for each of the six curriculums of the college in Table I. Certain variations appear. For years the music department has lived in cramped quarters and the enrollment of only one applicant out of two was possible—hence great selectivity was necessary. Also, since music requires highly skilled preliminary training, additional guidance facilities were available to music applicants. In any event, only 12 per cent of the music students came from the lower half. Turning to the department of secondary education, we find that 31 per cent were from the lower quarters. This is the curriculum into which students often go when the objectives of their programs are uncertain.

An answer to the question, Does high school rank appear

TABLE I

STUDENTS BY HIGH-SCHOOL RANK IN EACH COLLEGE CURRICULUM SHOWING PERCENTAGE GRADUATED

Rank in High-School Class	Per Cent in Quarter	Per Cent Graduated	Rank in High-School Class	Per Cent in Quarter	Per Cent Graduated
(1)	(2)	(3)	(1)	(2)	(3)
Art (41 students)—			Home Economics (51 students)—		
1st Quarter ...	46	68	1st Quarter ...	65	60
2nd Quarter ..	22	66	2nd Quarter ..	31	56
3rd Quarter ..	22	22	3rd Quarter ..	4	100
4th Quarter ..	10	25	4th Quarter ..	.....	.....
Total	.....	54	Total	.....	60
Business (83 students)—			Music (64 students)—		
1st Quarter ...	63	58	1st Quarter ...	58	76
2nd Quarter ..	16	70	2nd Quarter ..	30	84
3rd Quarter ..	14	33	3rd Quarter ..	8	80
4th Quarter ..	7	50	4th Quarter ..	4	.....
Total	.....	55	Total	.....	75
Elementary-School Teaching (139 students)—			Secondary-School Teaching (138 students)—		
1st Quarter ...	55	66	1st Quarter ...	38	53
2nd Quarter ..	24	58	2nd Quarter ..	31	59
3rd Quarter ..	16	32	3rd Quarter ..	17	43
4th Quarter ..	5	28	4th Quarter ..	14	22
Total	.....	57	Total	.....	49

to determine success in college? is found in the percentages of the total group of 516 students. Sixty-three per cent of those in each of the two upper quarters (170 students and 85 students) were graduated. In some college curriculums it was the second-quarter high-school graduates who had the greatest staying power in college. Note also that only 29 students (40 per cent) from the third quarter and 10 students (26 per cent) from the fourth quarter held on to the end in spite of the screening process at the start. Evidently selectivity is a continuous feature of college education.

Apparently nothing succeeds like success. Again, glance at the figures for the music and secondary curriculums. Music, with 88 per cent from the upper half of high-school classes and with other selective processes operating, graduated a higher percentage than did secondary. Also, the all-college totals by quarters show that only ten persons of the 38 entering from the lowest quarter were graduated. Perhaps we expend too much effort at Indiana in attempting to salvage this small proportion of the group.

TABLE II

STUDENTS BY HIGH-SCHOOL RANK AND QUARTILE ON AMERICAN COUNCIL ON EDUCATION PSYCHOLOGICAL EXAMINATION, SHOWING NUMBER AND PERCENTAGE GRADUATING*

RANK IN HIGH-SCHOOL CLASS	QUARTILES IN THE AMERICAN COUNCIL ON EDUCATION PSYCHOLOGICAL EXAMINATION			
	0–25		26–50	
	Number of Students	Per Cent Graduated	Number of Students	Per Cent Graduated
1st Quarter	48	54	53	58
2nd Quarter	39	56	39	64
3rd Quarter	22	27	22	41
4th Quarter	23	13	10	50
Total	132	43	124	56
	51–75		76–100	
1st Quarter	69	58	90	77
2nd Quarter	35	66	14	72
3rd Quarter	13	46	10	40
4th Quarter	2	50	2	100
Total	119	59	116	73

* Records do not show test score for 25 students.

THE scores which the students of the 1949 group made on the American Council on Education Examination were studied in relation to their high-school ranks. Table II shows that 73 per cent of those students who scored in the upper quartile of the A.C.E. test remained till graduation, while only 43 per cent of the lowest quartile held fast. Probably high-school success is a better guide than a placement test in determining whether a student will do college work. Considering both rank in high school and A.C.E. quartiles, it should be noted that only 3 students (1 per cent) of the 294 graduating were in the lowest quartile in both.

Incidental to the main purpose of this study, the students' records were tabulated according to the size of the high-school graduating class. Surprisingly enough, over 313 (60 per cent) of the Indiana students were from schools graduating over one hundred. The size of the class, however, had little effect in predicting college success. If anything, there is a slight edge for the large high school. Perhaps this is a good omen in view of the jointures which are now producing the larger administrative units.

In summary it can be said that in the experience of one

teachers' college, approximately four-fifths of the students come from the upper half of the high-school enrollment and about 87 per cent of the graduates are from this group. In addition, it should be remembered that 57 per cent of those entering received certificates to teach, which in itself is evidence of selection.

Of the 516 students who entered in the fall of 1949, there were 222 individuals who left college before graduation. Sixty-four per cent of these students left by the beginning of the sophomore year. That is, 28 per cent of those enrolling in 1949 had withdrawn by September, 1950. The following table shows the students' percentage of withdrawal each semester:

Semester	Per Cent
First	23
Second	41
Third	13
Fourth	13
Fifth	5
Sixth	5
Seventh	1

The operation of the junior-standing process at Indiana seems to predict that there will be little withdrawal after the close of the sophomore year.

When we ask why these students withdrew, we are somewhat in the realm of conjecture. A student often hides behind excuses. He may claim that finances are his problem when actually he has made no friends and finds college forbidding. Or he may say his draft board is after him when it is communication and science courses that are bothering him. The reasons given by these 222 students for leaving college are summarized as follows:

	Per Cent
Health	5
Finances	5
Home problems	4
Military service	5
Marriage	11
"Not interested"	16
Scholastic	18
N.P. R*	17
N.P. R.* junior standing	8
Not known	11

* N.P. R. is an abbreviation for the phrase "not permitted to register."

Some explanation of the classifications in this table is in order. "Home problems" may be caused by death, injury, or illness

in the immediate family. Scholastic reasons cover the group that at the time of withdrawal did not have a *C* average but furnished no reason for withdrawal. The college did not forbid, nor did it encourage, these individuals to return. "Not interested" includes the students with changing objectives, which frequently brought about a shift to another college. "N.P.R." refers to those not permitted to register, chiefly for scholastic reasons and previous to the action on junior standing. "N.P.R. junior standing" may include any of the phases of junior standing; it is not confined to scholastic reasons alone.

With these explanations in mind let us examine the reasons for withdrawal. Several of the groups might be considered as beyond student control—"Health," "Finances," and "Home Problems." These account for 14 per cent of the withdrawals. "Military service" drew 5 per cent which might also fall in this group although this reason is often used as an escape mechanism. The high number (11 per cent) withdrawing for marriage is probably owing to the advent of the Korean War. Under "Not interested" are many who changed objectives and transferred to become laboratory technicians, dietitians, business men, secretaries, and the like. It is hoped that Indiana helped these 35 persons—one of every six who withdrew—find their places.

"Scholastic," "N.P.R.," and "N.P.R. Junior Standing"—withdrawals recommended by the college—were the reasons 97 persons (43 per cent) left. The attempt was made to assist these students to attain other objectives; here, at least, we observe some recognition of the responsibility of the college to the profession.

Some of the 26 persons giving no reason for withdrawal left during the first semester. Since classmates did not know them, probably this number included many who were unsocial and would not have been adapted to teaching.

THUS we find that one teachers' college has had the experience of preparing a group of capable young persons to enter the teaching profession. Can it be said that high-school standing is a measure of ability? If so, then we find that 87 per cent of those graduating were from the upper half of the class. Does the college hold the better students? On college placement tests 53 per cent who graduated were in the upper

half based on national norms. And 65 per cent of those students from the lower half of the high-school class did not finish.

Here we see the selective process for the teaching profession in operation. Other institutions in the commonwealth are striving to prepare better teachers. Confident that a job is being done, teachers' colleges ask that the best possible students be sent to them.

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The Influence of Academic Standing upon Success in Student Teaching

By C. L. MAJOR

Not long ago a head of one of the departments of Denison University called to discuss with the writer the criteria used by the Department of Education for rating student-teachers. When the procedure of evaluation had been explained, I accepted it as reasonable but raised a further question implying bias in the rating of student-teachers in certain subject areas where the academic record of students was higher than average. Knowing that all human beings are likely to be biased, consciously or unconsciously, on almost any topic, I accepted the challenge to study the problem in the hope of satisfying the professor and of providing the members of the Department of Education with a more objective idea of how our rating of student-teachers in the several areas varied, and how this variation was related, if at all, to their academic records.

A random sampling of two hundred students who had completed student teaching was taken from the files of the Education Department. The sample included twenty students from each of the following teaching areas: English, history, language, mathematics, music, natural science, physical science, physical education for men, physical education for women, and social science. The academic record as well as the student-teaching record of each student-teacher was then reduced to a point-hour ratio. The average point-hour ratio both in student-teaching and in academic standing for each of the ten groups was then determined. From these averages the graph reproduced in Figure 1 was constructed.

Certain things stand out clearly in the graph. In the first place, the total academic college record of student-teachers in mathematics was only slightly higher than that of men teaching physical education. Yet, the average rating of student-teachers in mathematics was the highest of the ten groups, the twenty women teaching physical education being their closest competitors. In the second place, while it was clear that the group with the highest academic rating was the language group, the rank of this group in student teaching was next to the bottom, being robbed of the "booby" by the group in physical science. In the third place, with the exception of the language group, there is

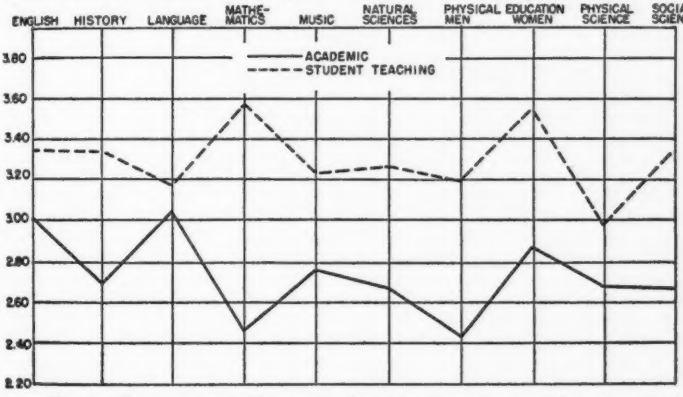

Fig. 1. The average point-hour ratios in total college courses made by two hundred students compared with their records in student teaching.

a considerable gap between the average point-hour rating of the academic record and that of the student-teaching record. The average width of this gap is .52 of a point, or about the equivalent of half the difference between two letter-grades.

If one assumes a close relationship between academic standing and teaching success, then it will appear that this department has been guilty of marked bias, operating on the one hand, for example, to mark up the achievement of student-teachers in mathematics, and, on the other hand, to underrate students teaching in the languages. But this assumption does not appear to be valid, because the coefficient of correlation between academic standing and student-teacher ratings, for the two hundred in this study, turned out to be only $-.016 \pm .07$. This indicates

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Investigations of Teacher Supply and Demand Reported in 1952

By R. H. ELIASSEN AND EARL W. ANDERSON

THE following quotation indicates the seriousness of the present situation in regard to the supply of and the demand for teachers:

> With a 50 per cent expansion of the elementary school population already well under way, and with a like expansion of the high school population soon impending, the task of arousing the public to aggressive action (in providing an adequate supply of well trained teachers) is the responsibility of every professional worker (36).

In 1952 we were no nearer to a solution of the problem than we had been the preceding year; however, some progress had been made. Although there is an increasing awareness of the seriousness of the situation, it will take herculean efforts to meet the predicted demands for thousands of additional teachers as well as greatly increased housing facilities.

Whereas the ratio of demand to supply remained about the same in the elementary-school field in 1952, the surplus of secondary-school teachers which existed in most subjects was reduced or eliminated. When the large enrollments resulting from the high birth rates of the war years begins to affect the high schools, there will be a serious shortage of secondary-school teachers unless students in training are guided into the areas in which the demand is greatest.

The most significant study of teacher supply and demand —increasingly becoming the official investigation of this problem—is the one made by Maul (37), who has also conducted a number of related studies stemming from the main investigation (2, 34, 35, 36, 38). In New York, New Jersey, and Wyoming, continuous studies have been carried on over a period of years (20, 39, 49). Important investigations were made in Indiana by Richey and others, and by Wendholt. Richey's group continued a series of investigations of the factors high-school students associate with teaching as a vocation (47). Wendholt made a very thorough and most extensive state-wide study of teacher supply and demand which is reported in 400 pages, with 125 charts (58).

Another of the continuous studies made in this area since 1946 is sponsored by Phi Delta Kappa, professional educational fraternity. It features the recruitment angle (32). Portland, Oregon, reported an ambitious and seemingly efficient program of re-educating high-school teachers to become elementary-school teachers in a city system (16). Probably additional states have set up such conversion programs since 1951 in addition to the 13 reported for that year (19). Kansas described a successful state-wide system of teacher recruitment (Teacher Reserve Mobilization Program) jointly sponsored by the state education association and the state teachers' colleges. The state is divided into five regions, each with a state-supported teachers' college as a pivot; each region is thoroughly canvassed for teacher recruits (27, 52).

INFORMATION about the supply of teachers and the demand for them was presented by placement officers of Ohio State University and Indiana University (42, 29). In two issues of its *Research Bulletin* the National Education Association presented an analysis of teacher personnel practices throughout the United States in 1950–51 (40, 41).

Maul predicted that by September, 1952, there would be ten thousand qualified teachers needed to relieve overcrowding, twenty thousand to meet the increased enrollment, sixty thousand to replace the annual losses from dropouts from the profession, and seventy thousand to replace the worst of the undertrained. The total reached indicated that one hundred sixty thousand qualified teachers were needed. To meet this demand, the colleges succeeded in preparing only one-fifth of the number needed for that year: 32,443. In other words, not more than one out of five positions to be vacated could be filled by a qualified teacher graduating from college in 1952. The remaining four positions would have to be filled by retaining partially qualified teachers, inducing former teachers—some fully and some only partially qualified—to return to the profession, redirecting teachers prepared for other types of teaching into elementary-school teaching, temporarily licensing persons with general college training but with no professional preparation for any kind of teaching, and continuing to employ teachers completely unfitted to conduct the education of children (37).

Representing the National Education Association, Givens gave the following estimate of the number of teachers needed:

100,000 new teachers to reduce class-size
40,000 new teachers to replace emergency teachers who cannot qualify in a reasonable time
158,000 new teachers to replace those who cannot readily meet the four-year standard
75,000 new teachers to fill annual vacancies
15,000 new teachers to meet the rising enrollments (23)

This totals 388,000 new teachers. These figures are not necessarily in disagreement with those of Maul, who indicated the minimum demand only.

Bowers has stated that the greatest need for teachers in 1952 shifted from the rural elementary to the urban elementary centers. The urban situation is complicated by the fact that the trend toward publicly supported kindergartens is taking some of the best teachers away from the elementary schools (53). As usual, the need for men teachers is stressed (17), and it is recommended that schools be given higher priority by those concerned with manpower (23). It appears from the Ohio State study that the demand for college teachers was lower than it had been in recent years (42). Hammer reported that the teacher shortage which is so prevalent in this country at the present time is really a world-wide phenomenon. He believes that

> . . . as long as education fails to match business and industry in the struggle to attract and hold high caliber personnel, the teacher supply problem will continue to be acute. . . . The fact is, however, that in spite of our knowledge of the increasing need [due to increased birth rate] there is little indication of our having more teachers in the years ahead (25).

Niederhauser's statement of the demand-supply situation as analyzed at Ohio State University is typical of the situation in the country as a whole:

> The demand for elementary-school teachers was the highest in the history of the Division of Appointments. In contrast with conditions during the previous two years, there was an unusually high demand for secondary-school teachers in most subject-matter areas. The demand for school administrators continued to be high, particularly for supervisors and principals, in both elementary and secondary schools. On the whole, the placement of college teachers was more difficult than at any time during the previous five years.

In the secondary-school fields, music was the subject in greatest demand, with English a close second. The calls for English teachers were 50 per cent more numerous than during the previous year. Other secondary-school subjects in order of demand were: commercial subjects, mathematics, science, industrial arts, men's physical education, women's physical education, and social studies. Special education received more calls than in previous years. Latin had more calls than any other foreign language (42).

The Indiana University Bureau of Teacher Recommendations noted a critical shortage in elementary-school teaching. The demand in the high schools absorbed most of the available teachers; the few who were not able to find positions in high schools qualified for temporary certificates for elementary-school teaching. In colleges, there was an oversupply in some liberal-arts fields, in physical education for men, and in music. Shortages of college teachers were found in home economics, chemistry, physics, biological sciences, elementary education, business administration, and educational psychology. The demand for well-prepared instructors for Negro colleges was far greater than the supply (29).

A NUMBER of investigators have, as usual, listed what appear to be the main causes for the continued serious shortage of teachers. These for the most part were similar to those listed in previous summaries. Some of the reasons most frequently mentioned were:

Students, in both high school and college, have inadequate and, in many cases, inaccurate information about teaching (5, 7, 13, 15, 43, 47).

Teachers' salaries are too low (17, 25, 32).

Beginning teachers are given inadequate orientation to teaching (50, 53).

The public in general is indifferent toward teaching (12).

Working conditions for teachers are too often unsatisfactory (12).

The failure to orient new teachers needs particular stress because it seems to be one of the forgotten factors in teacher supply. Russell states that the problem of teacher supply is both a question of how to get teachers and also how to keep them once they are secured. He claims that many fine teachers leave the profession each year who might have been salvaged if proper steps had been taken to hold them. He contends that

happiness on the job, opportunities for professional growth, outlets for initiative and creativeness, and freedom from tensions and petty politics in the schools are four aspects that need to be stressed in every teaching situation. New teachers should get a warm welcome into the school and the community, and should be made to feel wanted and important.

> The teacher shortage may not be as great as it seems if we all pitch in and do our part of the job. Let's do our best to make as many good teachers as possible out of the seventy thousand undertrained, reduce the number of annual walkouts, hold on to those thirty thousand or more graduates that the colleges have produced for 1952. These are our teachers. They want the joy of teaching, the joy of living in a good community, the opportunity for professional growth, and the chance to do a good job and put into practice what they have learned (50).

Bowers makes a similar plea when he states that not only must we induce more good high-school graduates to consider elementary teaching but steps must be taken to conserve the supply already on hand. In his judgment, too many new teachers drop out of teaching because of conditions that could be improved with better supervision and more attention to the adjustment of beginning teachers (53). Vick found that only 65 per cent of the teacher-education graduates of the Illinois state teachers' colleges accepted teaching positions (57).

SEVEN somewhat novel factors that influence the demand for teachers are listed by Wendholt; namely, natality, mortality, migration, population, enrollment, progressive reduction of enrollments, and class-size. Most of these factors are self-explanatory, but *mortality* and *progressive reduction of enrollments* are terms which may need clarification in this context. This investigator has computed *mortality* as the number of children who die in their first year, and who are then subtracted from the natality figures. He discovered, however, that the in-migration of children largely canceled this as an important factor. The *progressive reduction of enrollment* refers to the gradual reduction of pupils as they proceed through the grades. Thus, counting the first-grade enrollment as 100 per cent, the eighth-grade enrollment would be somewhat lower, and the twelfth-grade according to his computations would have an index of only 58.1 per cent (58).

MANY investigators make explicit recommendations for the improvement of the situation, and other recomendations are implied by the reports. Dangers of unwise action are: the risk of lowering standards (1, 12, 34, 39), the temptation to use short cuts to training, and the strong urge to increase pupil-teacher ratios.

Twelve recommendations, many of which have already been put in practice by individuals, schools, and colleges throughout the country, are important enough to list here.

1. There should be more vigorous teacher recruitment, particularly in the high schools (7, 32, 33, 36, 38, 43).

High school staff members, both teachers and administrators, are in an ideal position to help students thoughtfully weigh the facts and evaluate their own interests and aptitudes. Not only the future status of teaching as a profession but the continuance of the public school system as a major force in a democratic society will be determined by the attitudes and actions of the teachers, counselors, and administrators most intimately associated with the youth of the nation (36).

2. To cope with the problem more adequately, there is need for more state-wide studies of teacher recruitment and teacher supply and demand (7, 27, 52). Studies made continuously over a period of years are particularly valuable. New York, New Jersey, Ohio, Connecticut, Florida, and Wyoming, have conducted such studies.

3. Prospective teachers and teachers in training are in great need of constructive and intelligent guidance (11, 36, 43).

4. Future Teachers of America chapters and clubs are to be greatly encouraged in high schools and colleges (21, 32).

. . . FTA stands today on the threshold of greatness. It can meet the challenge of teacher shortage—if each state association joins with the NEA in helping youth to plan a statewide FTA program for colleges and high schools; if each local association undertakes to build strong college chapters and high school clubs; and if each chapter works with high schools, colleges, and educational associations to create a dynamic statewide FTA program . . .

. . . . . .

The FTA high school club provides an action program through which we can increase the number of young people who will enter teacher training. If efficiently used, the club will serve to guide toward the teaching profession only those students who in aptitude, personality, and character offer the best promise of becoming worthy teachers (21).

5. Teacher remuneration needs to be increased (17, 25, 32, 41). Hammer asserts that for a profession such as teaching, salaries should be from five to six times the per capita income. As a matter

of fact, they are only 1.9 times the per capita income. A study of twenty-five countries reveals that in less than one-half of them is the teacher's salary as much as three times the per capita income (25).

6. States need to practice more reciprocity in teacher certification (6, 14). Kentucky has taken the lead in making it possible for teachers to qualify more readily for teaching in states other than the ones in which they were trained (14).
7. Plans for the re-education of high-school teachers to prepare them for teaching in the elementary schools need to be stressed. Not only will this provide more elementary-school teachers but it will enable teachers who might otherwise drop out of the profession to get valuable teaching experience (16).
8. Year-round teacher-education programs should be increased (1). Such programs make it possible for the prospective teacher to complete his program more rapidly.
9. More states should experiment with the so-called common curriculum (sometimes referred to as the unified or single curriculum) in which students preparing for elementary- and secondary-school teaching are able to qualify for either or both levels of teaching. Armstrong states, "if all the 109,000 teachers who completed their initial preparation last spring were qualified for the positions that needed to be filled, there would not now be a serious shortage" (4).
10. Communities and schools should provide satisfactory teaching conditions (12). This is a recommendation that is closely associated with proper supervision and orientation to teaching as well as adjustment to the community.
11. Public-relations programs of public schools should be improved (12).
12. Teaching scholarships should be available to make college attendance possible for the needy student (30, 45). New York State has recently provided a lump sum of $650,000 in its 1952–53 budget to be used for scholarships for deserving teacher candidates (46).

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EDITORIAL COMMENT

In-service Education: New Approaches

In the December 10 issue of the Bulletin, we editorially discussed the need for a broader concept of in-service education of teachers. We argued that certification requirements and salary schedules have tended to overemphasize formal study in a teacher-education institution and that they should take account of other types of experience that contribute to professional growth. We noted the need for, and the difficulty of developing, adequate means of evaluating such experiences. Finally, we stated that certain recent developments offered suggestions as to how the problem might be attacked, and promised to discuss these in a future issue of the Bulletin.

This editorial is written in fulfillment of that promise. Obviously, it is impossible in a few hundred words to deal adequately with the topic; to do so would require a book. The most that can be attempted here is to describe briefly a few of the efforts to meet this problem—efforts which offer suggestions to persons who are concerned about it.

One of the most noteworthy developments is the program of one-year fellowships for high-school teachers provided by the Fund for the Advancement of Education and in effect this year. This program is administered by a National Committee on High School Teacher Fellowships established by the Fund. One fellowship was offered in each of four hundred local school systems of different sizes and distributed throughout the country. Each of the four hundred superintendents was asked to appoint a local committee comprising one school administrator, one teacher, and "several able and representative citizens" to select the most appropriate candidate for the fellowship. Each candidate designed his own year's program and submitted it to the local committee. The committee nominated the recipient; the National Committee agreed to accept the nominees of the local committees "except where in its judgment, the specific plan of activities submitted falls outside the intent of the program." A plan which provided for advanced study of the major field or advanced courses in education was not acceptable.

Each grantee receives the amount of salary he would receive during the year, but not less than $3,000, plus necessary travel and other incidental expenses.

This program is flexible enough to offer opportunity for many different types of activity. But, since the plan proposed by the teacher must be approved by both the local and national committees, there is insurance against acceptance of any mere "sight-seeing" plan. As a matter of long-range policy, the exclusion of advanced study of the major and of education courses would be inacceptable; these have an important place in in-service education. But at short range and as a corrective of the present overemphasis, ruling them out is probably justified. It is difficult to imagine any plan approved under this program that would not merit any salary increase or any upgrading of certificate that would be granted for a year of study under conventional plans.

ANOTHER plan that is suggestive is that recommended by Alfred D. Simpson and his associates for the schools of Hartford, Connecticut.[1] This plan provides, in addition to a salary schedule for "satisfactory" teachers, a scheme for additional salary increases for those who show competence above the "satisfactory" level and thus qualify for "competence-scale classification." To secure this rating, the teacher, besides carrying on the required formal in-service training, would have to make a score at or above the sixtieth percentile on the Common Examination of the National Teacher Examination, and secure a judgment from the Board of Review that all other aspects of his competence were within the upper 40 per cent of the competence range of Hartford teachers.

The Board of Review would consist of three persons "competent in the selection, training, and evaluation of teachers, and with suitable training therefor," at least two of whom are from outside the Hartford system. One would be chosen by the superintendent of schools, another by the Staff Council on Personnel Development, and the third by the other two. The judgment of the Board concerning the competence of a teacher would be based upon an examination of cumulative personnel

[1] "Survey of Instructional and Administrative Salaries, Hartford Public Schools." Cambridge, Massachusetts: Center of Research and Field Studies, Harvard Graduate School of Education, 1948. For a fuller discussion of this plan, *see* "Higher Salaries for Superior Teachers," EDUCATIONAL RESEARCH BULLETIN, XXVIII (March 16, 1949), pp. 77–78, 84.

records; interviews with teachers concerned, and with administrators, supervisors, and personnel staff; observation of the teacher's work; and such other materials and procedures as the Board might see fit to use. Since the majority of the Board members would be from outside the Hartford system, the work of the Board would do much to avoid the difficulties that are likely to arise when supervisors' ratings of teachers are used as a basis for salary increases.

THE schools of Champaign, Illinois, have a plan by which educational travel, work experience, study of professional books, authorship, educational experimentation or research, auditing college courses, and participation in workshops or clinics are translated into the equivalent of semester-hours of credit. The evaluation of these experiences is in the hands of an evaluation committee consisting of the superintendent of schools as chairman and six teachers. Of the teacher members, two each are elected by elementary school, junior–high school, and senior–high school teachers. Each member serves two years, half the terms expiring each year. In evaluating the experiences the committee must conform to standards prescribed by the board of education.

One of the most effective means of in-service education, which has increased greatly in recent years, is the workshop. One of the many examples of utilizing the workshop is provided by the Baltimore schools. For the past six years they have been conducting workshops on various topics to supplement the conventional system of in-service training. These carry no college credit but do carry a small amount of salary-scale credit. In 1952, for example, there was a workshop in which some twelve hundred teachers devoted a week to hearing about and visiting business and industrial establishments of the city. Such an experience must have been more valuable to many of the participants than a full summer's conventional in-service education would have been.

These are a few of the plans that attempt to correct the overemphasis on conventional in-service education. Each offers suggestions for dealing with an important problem—a problem whose solution calls for the best efforts of the profession.

R. H. E.

READINGS

Books to Read

MARTIN, MICHAEL, AND GELBER, LEONARD. *The New Dictionary of American History*. New York: Philosophical Library, 1952. vi+695 pp.

The reviewer tested this book by looking for significant Ohio items and found these not listed: Moravians, Schoenbrunn, Marietta, Rufus Putnam, Fort Ancient, Zane's Trace, Seven Ranges, Virginia Military Tract, Zoar, Simon Girty, Thomas Ewing, Thomas Corwin, Clement L. Vallandigham, Theodore Weld, Washington Gladden, Daniel Decatur Emmett (or "Dixie"), and others. While some of these can be found under other headings, only the specialist would know where to look. Among the inaccuracies and misstatements, the following may be cited: Ohio was "discovered in 1749 by a French officer, Celeron" (page 450), which would astonish that "discoverer," who was sent to warn off English traders; Connecticut granted from her Western Reserve "500,000 acres on Long Island Sound" (page 666) to compensate her Revolutionary War sufferers (presumably the Firelands of northern Ohio); Secretaries Fall and Denby and Charles R. Forbes of the Veterans Bureau were members of the "Ohio Gang" of Harding infamy.

With a few exceptions, chiefly presidents, biographies give only the year and the state of the subject's birth, and no items are provided with references. Far too much space is allotted to recent figures, yet James M. Cox, Alfred M. Landon, Speakers Rayburn and Martin, and Senators Nixon and Sparkman are omitted. General MacArthur gets 33 lines, Eleanor Roosevelt 20, William McKinley 16. The book contains much useful information but will hardly serve as a substitute for the older five-volume *Dictionary of American History*, of which this is neither a revision nor a condensation, in spite of its title.

EUGENE H. ROSEBOOM

KAPP, K. WILLIAM, AND KAPP, LORE L. *A Graphic Approach to Economics*. New York: Henry Holt and Company, 1951. xviii+174 pp.

Charts, graphs, diagrams, and pictograms are a great help in teaching economics. Many of the basic relationships can be skillfully dramatized by them, especially when used by an imaginative and creative teacher. The authors of this volume have prepared an anthology of visual aids which have already been used in the published literature. They have furnished an introduction to each of the fields of economics and for each of the charts, maps, and so on. In their preface they have pointed out the use and limitations of the graphic method. Finally, they have provided in an appendix a source list for films, filmstrips, and books making extensive use of graphic methods.

There are some important faults which should be indicated. They have deliberately left out price theory and firm analysis because these are usually illustrated in the textbooks. It is true, they are, but usually with little imagination. They have therefore omitted a section on a topic which is perhaps the most challenging and most needed. While most of the data is recent, some variations in dates would require special caution. Most of the charts

are simple enough, but a few of them are much too complicated (for example, those on the flow of spending and earning and the national income). There is a section on the "Problems of Economic Mobilization" but little to indicate the changed nature of the free-market economy during a mobilization. Another serious omission is a lack of charts, and so on, illustrating the workings of an economic system, one of the most difficult family of ideas to convey. Yet it is possible to do much with diagrams by way of explanation of the price system or planning.

MENO LOVENSTEIN

TINKER, MILES A. *Teaching Elementary Reading.* New York: Appleton-Century-Crofts, Inc., 1952. xii+351 pp.

There is a vast professional literature on the subject of the teaching of reading—so vast, in fact, that at times one may wish for a moratorium on any further writing that is not distinctively original in the field of research or of philosophical ideas or of innovating practices. While this book does not—and makes no pretense to, at this point—project new ideas or findings, it is a precise, succinct, readable presentation of how to carry on a well-balanced developmental reading program in the elementary school.

Tinker defines reading thus:

> Reading involves the recognition of printed or written symbols which serve as stimuli for the recall of meanings built up through past experience, and the construction of new meanings through manipulation of concepts already possessed by the reader. The resulting meanings are organized into thought processes according to the clearly defined purposes of the reader. Such an organization leads to modified behavior, or else leads to new behavior which takes its place, either in personal or in social development (page 11).

From this viewpoint, he has included particularly interesting chapters on reading readiness, word recognition, word meanings, the development of comprehension, and appraisal of growth in reading.

If elementary-school teachers creatively put into practice the principles for teaching reading which Tinker proposes, many children would have healthier and happier experiences in learning to read.

LELAND B. JACOBS

BRUBACHER, JOHN S., editor. *Eclectic Philosophy of Education.* New York: Prentice-Hall, Inc., 1951. viii+520 pp.

As indicated by the title, this is a survey of education presented in selections from the writings of outstanding thinkers mostly of today, although the classic writers from Plato to Spencer and Newman receive some notice. The space allotted them is small: Plato, one-half page; Aristotle, one-third; Kant, four; Spencer, one; Horace Mann, two, and so on. Dewey receives most space, with 31 citations, totaling about 75 pages. Next comes Horne with 31 citations, Kilpatrick with 14, Childs with 8, and so on down to Elliott, Freeman, and A. L. Lowell with 3 each.

The topics cover a wide range from the philosophy of education to techniques of method, curriculum, discipline, moral and religious aspects. The book constitutes an anthology of passages on essential problems which may be used to gain a glimpse of what has been said on educational issues without attempting to master the whole of the vast literature. Such use would of course have its weaknesses as well as its advantages, affording possibly a pseudo

mastery of the field. The editor has evidently ranged widely over many pastures. The volume would best be used as a guide to further reading for the specialist in education, and as a series of suggestions to the non-specialist for a glimpse of the topics and perspectives included in the educational field.

ALBERT E. AVEY

COOK, LLOYD ALLEN. *Intergroup Relations in Teacher Education.* Washington, D.C.: American Council on Education, 1951. xvi+271 pp.

This book is the second volume of a two-volume report concerning the College Study of Intergroup Relations sponsored by the American Council on Education. The first volume, *College Programs in Intergroup Relations*, describes specific college programs; the second volume presents an analytical study of the theory and practice of intergroup education that is not confined to the data obtained from the College Study.

The author examines three approaches to the study of intergroup relations: academic education, group-process teaching, and community education. He concludes that the second and third methods are more promising than the first in promoting the goals of intergroup education.

In making his comparisons, however, Mr. Cook tends to create a curious "straw man" as he describes academic education. He characterizes this method of education as one in which the teacher relies upon authority, the learner reacts with a "wall" of silence, and the class as a whole ". . . has no goal that is common, being dependent on the teacher to motivate its actions" (page 90). Yet, the author states that reflective thought is the *modus operandi* in this form of education.

Group-process teachers, in contrast to academically minded ones, ". . . put main emphasis, not on logic, . . . but on feeling . . ." (page 116). They employ "*the planful use of the group to influence behavioral change*" (page 109). Yet ". . . the entire process will be intellectualized at its conclusion" (page 116). Does the individual pupil arrive at his convictions in group-process education by means of emotion and group pressure or through the reflective process? This question emerges from the text, but is not answered.

The author includes interesting anecdotes and case histories. Unfortunately, many of these selections are not sharply relevant. All too frequently the author's style is verbose and his terminology vague.

ROBERT E. JEWETT

WATSON, MARGUERITE H. *How to Prepare and Use Job Manuals: a Handbook for Supervisors.* New York: William-Frederick Press, 1952. iv+38 pp.

Mrs. Watson presents a concise handbook for supervisors who accept job manuals as basic to good supervision and who need assistance in the preparation and use of manuals. Despite the publication's brevity, it is complete in basic information about job analysis and manualization: defining work procedures, amount of worker supervision, minimum worker qualifications, acquired worker qualifications during the learning period, and information which workers need to become constructive members of a unit and organization as a whole.

The writer strives for simplicity, clarity, and brevity in the written work

involved in the job-manuals project; she utilizes an outline form and sketches of unit physical layout, organizational charts, and work flow of the supervisory unit in an attempt to practice the conciseness which she advocates.

Six short chapters of the handbook are concerned with developing job-manual history and clarification of manualization terms, writing work procedures, assigning work to jobs, amount of available supervision, job qualifications, and assembling associated information. The construction and physical aspects of job manuals, keeping manuals up to date, and principal uses of manuals comprise the three latter sections of the handbook.

Brief consideration is given to the development of job manuals as co-operative group enterprises. Mrs. Watson states that "the greatest benefits have come from including the group as a whole at the start of the Job Manual Project" (page 3). In connection with gaining insight into weaknesses of work procedure, she prophesies that the supervisor will receive many suggestions from the workers themselves if the group is taken into the supervisor's confidence. Worker morale, developing team spirit among workers, human-relations skills required, and group leadership of the supervisor are mentioned as necessary accomplishments of the manualization process and its implementation in the work of the unit.

Despite the slight treatment of democratic group processes in the construction and implementation of the manuals project and its value to personnel relations, the handbook is recommended reading for all persons in supervisory rôles.

GEORGE BRANDON

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Investigations of Teacher Supply and Demand Reported in 1952

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The Influence of Academic Standing upon Success in Student Teaching

[*Continued from page 67*]

that the chances are even that the true correlation between academic standing and student-teaching of this rather homogeneous group will vary from slightly above to slightly below zero.

The coefficient of correlation in this study is not notably different from that found between teaching success and percentile rating on the Ohio State Psychological Examination as reported in a study by the writer in *School and Society* for April 30, 1938, where r was found to be .14.[1] It seems reasonably clear that academic rating above a certain critical point is not significant to such a degree that it can be used as a criterion for forecasting teaching success. [Vol. XXXII, No. 3]

[1] "The Percentile Ranking on the Ohio State University Psychological Test as a Factor in Forecasting Success of Teachers in Training," XLVII, p. 583.